



Predictors of Biologics Failure Among Inflammatory Bowel Disease (IBD) Patients in Saudi Arabia: A Single-Center Study

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INTRODUCTION

- Inflammatory bowel disease (IBD) is a chronic health condition that affects the digestive tract and negatively affects the health-related quality of life (HRQoL) of affected patients.^{1,2}
- There are two main types of IBD: Ulcerative Colitis (UC) and Crohn's disease (CD).¹
- Although it is largely believed that IBD is more prevalent among the western populations, the change in the lifestyle and exposure to different environmental factors has resulted in a rising incidence and prevalence rates of IBD in the Middle East and North African countries.³
- The aim of IBD treatment is to alleviate the symptoms and improve patients' HRQoL.¹
- There are different classes of medications that are prescribed for the management of IBD (e.g., biologics, mesalamine derivatives, glucocorticoids and immunomodulators).⁴
- Anti-TNF- α monoclonal antibodies (mAbs), such as infliximab and adalimumab, are the most commonly used biologics in the management of IBD both locally and globally.^{4,5}
- Although Anti-TNF- α mAbs are highly effective in the management of IBD, they fail at a varying rates in controlling the symptoms and preventing or slowing the progression of the disease.^{6,7}
- The cost of mAbs in the management of IBD is high and the failure to control the symptoms and improve patients HRQoL may lead to poor clinical and economic outcomes.

OBJECTIVES

- **The aims of this study are as follow:**
 - Examine the rates of treatment failure (e.g., progression of the disease despite treatment) among IBD patients treated with infliximab or adalimumab.
 - Explore the predictors of treatment failure among patients treated with mAbs (infliximab or adalimumab).

METHODS

- **Study design and patient population:**
 - This was a prospective single-center cohort study.
 - Patients aged ≥ 18 years enrolled in King Saud University IBD registry were followed up from the time of treatment initiation with either infliximab or adalimumab to switching to another mAb or other therapy due to disease progression as confirmed in the colonoscopy.
 - The follow-up period were between May 2015 to January 2020.
 - Patients with a disease duration less than 12 months as well as those with cancer were excluded from the study.
- **Study variables:**
 - Patients' demographic and medical characteristics (e.g., age, gender, weight, height, comorbidities, prescription medications, and smoking status).
 - Type of IBD (e.g., UC vs. CD), disease behavior (e.g., restricting, non-restricting, penetrating, and non-restricting non-penetrating), disease location (e.g., terminal ileum, colon, left-sided, and pancolitis), and disease severity (e.g., mild, moderate, and severe).
 - Lab and imaging studies results over the duration of follow-up.
- **Statistical analysis:**
 - Descriptive statistics (e.g., mean, standard deviations, frequencies, and percentages) Student's t-test, Chi-square, and Fisher's exact test were used to describe the study sample and examine the differences in patients' characteristics between the two groups.
 - Simple and multiple logistic regression were conducted to examine the association between the rates of treatment failure and the use of infliximab or adalimumab as well as other patient's characteristics.

RESULTS

Table 1A. Patients' baseline characteristics

Characteristic	ADA (n= 28)	INF (n= 118)	p-value	Total = 146
Age (years), mean \pm SD	32.86 (11.54)	30.77 (9.91)	0.3339	31.17 (10.23)
Male, N (%)	12 (42.86%)	74 (62.71%)	0.055	86 (58.90%)
Female, N (%)	16 (57.14%)	44 (37.29%)		60 (41.09%)
Location				
Terminal Ileum, N(%)	5 (17.86%)	28 (24.14%)	0.1056	33(22.92%)
Colon, N (%)	0 (0%)	2 (1.72%)		2(1.39%)
Ileocolon, N (%)	14 (50%)	58 (50%)		72(50%)
Pancolitis, N (%)	0 (0%)	9 (7.76%)		9(6.25%)
Left-sided, N (%)	7 (25%)	9 (7.76%)		16(11.11 %)
Behavior				
Stricturing, N (%)	5 (17.86%)	21 (18.1%)		26 (18.06%)
Non-Stricturing Non-Penetrating, N(%)	5 (17.86%)	33 (28.45%)	0.886	38 (26.39%)
Penetrating, N(%)	8 (28.57%)	31 (26.72%)		39 (27.08%)

Figure 1B. Percentages of UC & CD among Infliximab and Adalimumab groups



Figure 2A. Simple Logistic Regression for Potential Predictors of Biologic Treatment Failure

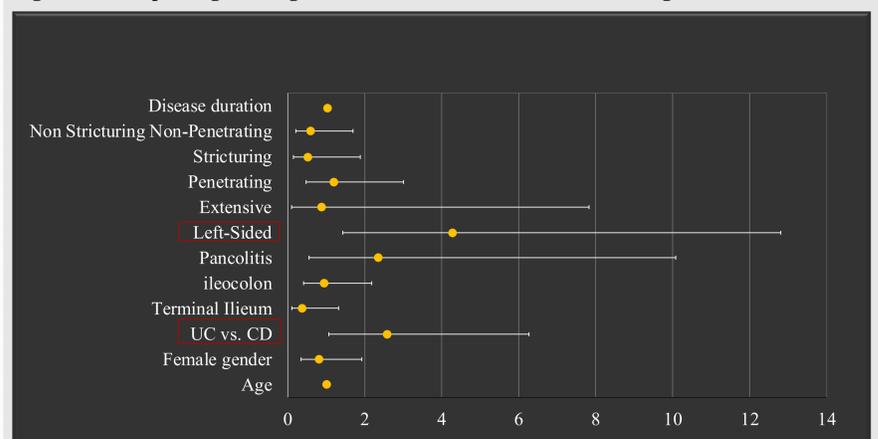


Figure 2B. Simple Logistic Regression for Potential Predictors of Biologic Treatment Failure

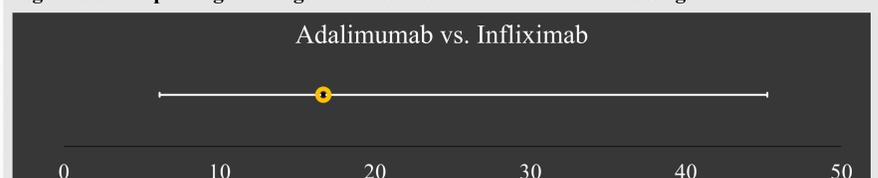


Figure 3. Multiple Logistic Regression for the association between treatment failure and the utilization of Adalimumab vs. Infliximab

Variable	Odds ratio (OR)	95% Confidence limits (CI)	p-value
Adalimumab vs. Infliximab	26.91	7.75 - 93.39	0.0001
Age	0.993	0.937 - 1.054	0.825
Female gender	0.259	0.072 - 0.930	0.38
UC vs. CD	2.34	0.54 - 10.14	0.2557
Left-Sided	1.886	0.288 - 12.34	0.5078
Stricturing	0.497	0.097 - 2.559	0.4034
Disease duration	0.977	0.858 - 1.113	0.728

DISCUSSION & CONCLUSION

- Although adalimumab is administered subcutaneously which is believed to be more convenient to patients and should result in lower number of clinic visits and healthcare expenditures, it has failed to demonstrate better clinical value in preventing the progression of IBD in comparison to Infliximab.
- Infliximab's public acquisition price is ~35% of the price of adalimumab with better clinical effectiveness in the management of IBD based on local real-world observational data.
- Future studies should further examine the validity of these findings using larger sample sizes and more robust study designs.

REFERENCES

